Cup Lid for Dispensing Hot Fluids

Field of Invention

The present invention relates to lids used to cap and seal an assortment of cups and containers in order to provide a focused point for dispensing any fluid contained therein for drinking.

Background

An variety of lids are currently available to cap and seal cups. Some lids are useful for capping a cup to prevent the escape of fluid contained therein, in other words the lids are spillproof. Other lids are also spillproof but, at the same time, enable fluid to be dispensed for consumption. Usually fluids are dispensed through a small opening near the rim of the lid upon tipping the cup away from the user, which tips the opening towards the users mouth. In some lids the top surface of the lid has a perforated opening with a tab. An opening is then formed when the user pulls the tab, which will create an opening as the section defined by the perforation is removed.

While many of the lids provide adequate seals to prevent unwanted spillage of fluids, delivery of hot fluids remain problematic. The problem that exists with hot fluids is that delivery to the user is direct and does not allow for timely cooling. Typically the cups for containing hot fluids are thermoresistant and require extensive time before cooling to a comfortable temperature occurs. Therefore, currently available lids allow for containment and dispensing of fluids while limiting spillage, but fail to prevent harmful and painful scalding of the users mouth, particularly the lips and tongue, when drinking hot fluids in a timely manner.

One prior art device attempts to solve this problem related to drinking hot fluids. US Patent No. 6,176,390 describes a container lid for covering a cup with a

reservoir built into the lid. The reservoir is a small well residing within the top surface of the lid and includes a small opening along the side of the well, which allows for entry of fluid into the reservoir upon tipping the cup upward. The small amount of fluid in the reservoir, which is now separate from the bulk fluid, is able to cool down quicker and allow for quicker drinking without risk of scalding. The lid also has a typical tab built into the other end of the lid, approximately 180° from the reservoir. This tab can be pulled and removed along provided perforations in order to create a direct opening into the interior of the cup. This provides a solution to the problem of drinking hot fluids but presents other problems. One problem is risk of spillage of the fluid in the reservoir. There is no spillproof containment of fluid upon entering the reservoir. Another problem is the difficulty presented by the act of tipping the cup and lid over to allow fluid to flow into the reservoir. There is nothing to prevent overflow, which will cause unwanted spillage. A further problem is that the reservoir can only hold a small amount of fluid, which is not a practical or desirable way to drink fluids.

A great need still remains for a lid that can seal a cup and prevent unwanted spillage and, at the same time, can provide an improved way to cool down hot fluids for drinking soon after it is dispensed into the cup without overly cooling the bulk fluid. A further need that remains is a lid that can cool portions of hot fluids in sizeable quantities that are ideal for drinking.

Summary of the Invention

The disclosed methods and apparatuses address the needs discussed above. In particular the methods and apparatuses disclosed below provide a better way of drinking hot fluids by reducing the risk of burning or scalding by the hot fluid while

still allowing consumption of the desired, relatively hot, but not scalding, fluid. This is accomplished by allowing the user to periodically separate out a portion of the hot bulk fluid so that the portion can be cooled to a "drinkable temperature". A "drinkable temperature" refers to a temperature below that which normally causes the skin or tongue to scald. Those in the medical field commonly know the scalding temperature.

In general, all aspects of the present invention provide a container lid that can store a portion of a bulk fluid in a reservoir present within the container lid for subsequent consumption. The bulk fluid can be directed into the reservoir so it can cool more rapidly than the bulk fluid remaining in the container. The increased cooling in the reservoir is partly due to a greater surface area to volume ratio, which causes more heat to escape per volume, of the portion in the reservoir relative to the bulk fluid. Furthermore, the container holding the bulk fluid is usually somewhat thermoresistant to prevent rapid heat loss, while the container lid does not have the same thermoresistant properties; therefore, this difference in thermoresistance further allows the portion in the reservoir to cool more rapidly than the bulk fluid in the container.

In general, the container lid comprises two parts, a base that physically connects to the container and a top that physically connects to the base, the top and base defining an empty space or reservoir. The physical connections between base and container and top and base are all spillproof connections. Spillproof refers to a connection that generally prevents the leakage of fluid from the site of the connection. This spillproof connection allows fluid to flow into the reservoir and out the top without spilling, i.e., the fluid only escapes the container-container lid combination through an outer spout located on the top. The spillproof connections can be

accomplished by threads, ridges or grooves that interact between elements. Generally, a number of these spillproof connections are generally well known in the art.

In one aspect of the present invention, the lid has a base having a raised inner spout for fluid to escape the container and enter the reservoir of the container lid. The inner spout is located near a radial edge of the base. Adjacent and radially inward from the inner spout is a depressed surface. In one instance, the depressed surface is a slope, i.e., a sloping section of the base that extends from the top of the inner spout on one side (the side closer to the center) and slopes downward to a level near the top of the container. The slope of the base ends on the opposite side of the inner spout at a generally level area of the base.

In another aspect of the present invention, the lid has a top physically connected to the base, which physically connects to the top of the container. This defines a reservoir or empty space within the container lid. The top has an outer spout for dispensing fluid from the reservoir. Preferably, the outer spout is raised to make drinking easier. The raised outer spout allows a user to locate the outer spout with the user's mouth without looking at the container lid. Also, the raised outer spout is better shaped to fit in a user's mouth. In another preferred embodiment, the top has a lip adjacent to and radially outward from the outer spout. This lip prevent excess fluid not consumed from spilling over the edge of the top, most likely redirecting the fluid back down the outer spout. More preferably, the top has an outer trough adjacent to and radially inward from the outer spout. This outer trough catches any excess fluid that is not consumed and does not flow back into the lid through the outer spout. Still more preferably, the embodiment has a top including a dome that creates

greater volume in the reservoir. The dome can be any raised area of the top of any shape but preferably shaped somewhat hemispherically.

Another aspect of the present invention includes a lid that has a rotatable top and a base, the rotatable top and base forming a reservoir. The reservoir can hold a portion of the bulk fluid held in a container capped by the lid. The rotatable top has an outer spout for dispensing fluid from the reservoir. In one particular aspect, the outer spout is raised to make drinking easier. The base has a raised inner spout for fluid to escape from the container and enter the reservoir of the container lid. The inner spout is located near a radial edge of the base. Adjacent and radially inward from the inner spout is a depressed surface. In one instance, the depressed surface is a slope, i.e., a sloping section of the base that extends from the top of the inner spout on one side (the side closer to the center) and slopes downward to a level near the top of the container. The slope of the base ends on the opposite side of the inner spout at a generally level area of the base. Bulk fluid is directed into the reservoir when the outer spout and the inner spout are radially 180° relative to each other. Once the portion of the bulk fluid in the reservoir cools to a non-scalding temperature, the portion can be delivered to the user for consumption through the outer spout. Once the bulk fluid has cooled to a drinkable temperature, or a non-scalding temperature, the rotatable top is rotated so that the outer spout base fits over the inner spout forming a fluid conduit that allows the bulk fluid to be delivered directly from the container through the outer spout.

One aspect of the present invention is a method of cooling a portion of bulk fluid comprising directing bulk fluid held in the container into a reservoir by first tipping the container with container lid away from a user while the user has the outer spout facing the user. This first tipping action causes bulk fluid to flow through the

inner spout into the reservoir. After tipping, the container is placed upright, which allows a portion of the bulk fluid to stay in the reservoir while some of the bulk fluid flows back into the container through the inner spout. All this occurs without bulk fluid escaping the top through the outer spout. After the portion of the bulk fluid remains in the reservoir, the portion of bulk fluid is allowed to cool over a relatively short period of time bringing the temperature of the portion of bulk fluid to a drinkable temperature. A relatively short period of time refers to a period of time that is much shorter than the time required to allow the bulk fluid to cool within the container and generally allows enough heat to dissipate so that the portion of bulk fluid can be consumed with scalding or burning the user. Preferably, the relatively short period of time will be under 2-3 minutes, and more preferably, under one minute. Of course, the time for cooling is directly dependent upon the characteristics of the container and lid and also the temperature of the bulk fluid. The above time frames are typical for common disposable containers and lids and bulk fluids at scalding temperatures.

Another aspect of the present invention includes a method of promoting cooling of a portion of bulk fluid from a container capped with a container lid having a base and a rotatable top. The base and rotatable top define a reservoir. The base includes an inner spout and the rotatable top includes an outer spout, which also has an outer spout base. The inner spout and the outer spout base fit to form a conduit for fluid. The method comprises (1) directing a drinkable portion of bulk fluid into the reservoir area for enhanced cooling relative to the bulk fluid when the inner spout and the outer spout are nearly 180° relative to each other, (2) allowing the drinkable portion to cool in a timely period, (3) dispensing the cooled drinkable portion to a user for drinking with reduced risk of scalding or burning, and (4) upon cooling of the bulk

fluid to a drinkable temperature, rotating the rotatable top so that the outer spout base fits onto the inner spout to form a fluid conduit for dispensing bulk fluid directly from the container through the outer spout.

The lid is generally produced from plastic or polymeric material that is well known in the art. Preferably, the lid is produced from plastic or a plastic-like material that is inexpensive without thermoresistant characteristics.

After the portion of bulk fluid is allowed to cool over a relatively short period of time, the portion of bulk fluid is dispensed for drinking by the user by a second tipping of the container. The second tipping tips the container towards the user with the outer spout facing the user. This causes the portion of bulk fluid to dispense out the outer spout and into the user's mouth for consumption.

The aforementioned aspects of the present invention and other aspects of the present invention will be understood by one of ordinary skill by reviewing the drawings and detailed description provided below.

Brief Description of the Drawings

Fig. 1 is a plan view of a container with a container lid attached.

Fig. 2 is a magnified cross-sectional view of container lid attached to top of container.

Fig. 3 is a plan view of container lid attached to top of container with top removed.

Fig. 4 is a perspective view of container lid.

Fig. 5 is a top view of container lid.

Fig. 6 is a vertical cross-sectional view of an alternative embodiment having a more permanent connection between the rotatable top and base.

Detailed Description of the Invention

According to the present invention, a fluid represents all drinkable fluids including coffee, hot chocolate, and tea, and also includes fluids that include solid materials, including soups. A spout is defined to include any opening in which fluid can be dispensed through either the base or top. In one particular aspect, the spout may be a part of a raised portion on either the base or the top.

An embodiment of the invention is provided in Fig. 1. The figure shows a lid 1 for capping a container to control spillage and direct outflow of fluid housed in the container. Fig. 4 and Fig. 5 show the lid from two different views, perspective and top, respectively.

Fig. 2 shows a lid 1 physically connected to a container. The lid 1 is comprised of a base 10 that caps a container and a top 20 that caps the base 10 to form a reservoir 12. The reservoir 12 is able to collect a portion of the bulk fluid separate from the remaining bulk fluid within the container. The portion of the bulk fluid held in the reservoir 12 is physically separate from the rest of the bulk fluid which remains in the container and typically cools faster than the bulk fluid, particularly when the container has been recently filled with a hot fluid, due to the increased surface to volume ratio and reduced thermal protection, relative to the container. In one aspect, the reservoir is of a volume large enough to hold at least four (4) tablespoonful of fluid. In particular, the portion of bulk fluid in the reservoir rests in a well area 14 that is the bottom of the reservoir 12.

The top 20 covers the base 10 such that the side 23 fits over the circumference of the base 10 to form a spillproof fit at the bottom of the lid 1. The lid 1 covers the container in a conventional manner, specifically, the bottom part of the lid 1 (generally open end) fits over the circumference of the container to form a spillproof

fit. Typically the lid 1 will slightly flex radially outward in order to fit over the circumference of the container in order to form a tight fit that prevent fluid from escaping at the point of interaction between the container and the lid 1. In other embodiment, the top 20 and base 10 can fit together and over the container by means of threading or other generally known removable connection means.

The base 10 is comprised of an inner spout 11 in which the bulk fluid in the container can flow into the lid 1 and into the reservoir 12 where the portion of the bulk fluid can collect for enhanced cooling. Furthermore, the base 10 includes a slope 13 which, upon the container standing vertical, directs much of the fluid entering the inner spout 11 toward the bottom of the reservoir 12 or a well area 14. Some of the bulk fluid typically returns to the container through the inner spout 11.

The top 20 is comprised of an outer spout 21 from which a user can direct fluid out of the lid 1 and to the user for consumption. Additionally, the top 20 contains a dome 22, which adds more volume to the reservoir 12 and allows more fluid to collect in the reservoir 12. The dome 22 refers to any raised area of the top 20, but preferably the dome 22 is a hemisphere. Also, the top 20 prevents spillage of bulk fluid as the container is tipped to collect bulk fluid in the reservoir 12. Once the portion of the bulk fluid is collected in the reservoir 12 and allowed to cool over a relatively short period of time, allowing the portion of the bulk fluid to attain a drinkable temperature. The container can then be tipped by the user to allow the cooled portion of the bulk fluid to flow out the outer spout 21 and into the user's mouth for consumption.

Additionally, the top 20 includes an outer lip 24 to provide a physical clue to the spot where the outer spout 21 is situated. The outer lip 24 can also act to help prevent accidental runoff of fluid as the container and lid 1 is tipped in unison. Also,

the top 20 contains an outer trough 25, which is a depressed region of the top 20 located just radially inward from the outer spout 21. The outer trough 25 can retain any unconsumed fluid that does not fall back into the lid 1. This also prevents any unwanted runoff of fluid, or spillage.

The present invention works by placing the lid 1 over the container to form a spillproof fit. The container having lid 1 attached is then tipped such that the bulk fluid in the container flows into the reservoir 12 through the inner spout 11. This is done by tipping the container away from the user while the outer spout 21 faces the user, i.e., the top of the container is tipped away from the user. Then the container having lid 1 attached is returned to the vertical or upright position, which allows some bulk fluid, or "a portion of bulk fluid," to collect in the reservoir 12, particularly in the well area 14. Specifically, the portion of the bulk fluid collected is directed toward the well area 14 by the slope 13 as gravity draws the portion of the bulk fluid downward. Once collected in the reservoir 12 while the container with lid 1 attached is upright or vertical, the portion of the bulk fluid can cool quicker than the bulk fluid in the container, especially soon after hot fluid is stored within the container. After a relatively short period of time, the cooled portion of the bulk fluid can then be delivered to the user for consumption by tipping the container with lid 1 attached such that the outer spout 21 tips downward into the user's mouth.

After a considerable amount of time has passed and the bulk fluid remaining within the container has cooled to non-scalding temperature, the top 20 can be removed from the base 10. The considerable amount of time is significantly greater than the relatively short period of time, which is the time period required to bring the portion of bulk fluid to a drinkable temperature. More specifically, it is the amount of time required for enough heat to dissipate from the bulk fluid so that the bulk fluid

can be consumed without scalding the user. This period of time depends upon the amount of bulk fluid remaining in the container and the amount of thermoresistance exhibited by the container. Generally the considerable amount of time is greater than 5 minutes. Fig. 3 shows the base 10 exposed to the outside. A user can now consume bulk fluid through the inner spout 11 versus the outer spout 21 when the lid 1 included the top 20. Once the top 20 is removed, the user can tip the container with base 10 attached towards the user with the inner spout 11 facing the user to dispense the bulk fluid to the user through the inner spout 11.

The base 10 is comprised of an inner lip 15 and an inner trough 16. These provide the same function as the outer lip 24 and outer trough 25 but with respect to the base10 and consumption from the base 10 (when top 20 has been removed). The inner lip 15 is adjacent to and radially outward from the inner spout 11. The inner trough is generally opposite from the inner spout 11 and is situated near the radial edge of the base 10. This allows any excess bulk fluid that is not consumed and not returned to the container to flow down the slope 13 and catch in the inner trough 16 without spilling over the edge of the base 10.

Fig. 6 shows another preferred embodiment of the invention consisting of lid 100, including a rotatable top 120 rotatably connected atop a base 110. The rotatable connection can be semi-permanent or removable. Even in the semi-permanent embodiment, the rotatable top can be removed, albeit with more difficulty than the removable rotatable top, so that the lid can be washed. The lid 100 is physically connected to a container in a manner that is generally well known in the art. Particularly, the connection can be a snap fit, screw fit, or a lock fit. A lock fit is widely use in cap or lid and container assemblies, which involves an interfering ridge on either the cap or container that has a small space, or multiple small spaces, and one

or more small extension(s) on the matching cap or container that fits through the space(s) when the cap is in a specific orientation relative to the container. An example of this type of connection can be found in some existing medicine containers, which often further include arrows on the exterior of the cap and container that can be aligned to signify the position in which the cap can be released from the container or snapped onto the container. Preferably, the lid 100 screws onto a container using threads that are complimentary to threads on the container.

Bulk fluid is directed to a reservoir 112 by first tipping the container plus lid 100 away from the user (the top tilts away from user) so that bulk fluid passes through an inner spout 111 and into the reservoir 112. Preferably, the inner spout 111 is raised. Once a portion of the bulk fluid rests in a well area 114 of the reservoir 112 and is allowed to cool over a relatively short period of time. When the portion of bulk fluid is at a drinkable temperature, the user can then drink the portion of bulk fluid held in the reservoir 112 by a second tipping of the container and lid 100 towards the user. The second tipping causes the portion of bulk fluid to flow though an outer spout 121 and into the user's mouth without scalding the user.

Once the bulk fluid is cooled to a drinkable temperature, which generally occurs after a considerable amount of time from the moment bulk fluid at a typically scalding temperature is dispensed into the container, the bulk fluid can be dispensed directly to the user. Direct dispensing is accomplished by rotating the rotatable top 120 relative to the base 110 so that the inner spout 111 aligns with the outer spout 121. The outer spout 121 has an outer spout base 122 that fits over the inner spout 111. In one particular embodiment, the connection between the outer spout base 122 and the inner spout is a spillproof connection. This provides a direct conduit in which bulk fluid can flow from the container through the lid 100 and to the user's mouth in a

single tipping action. Typically this embodiment, as shown in Fig. 6, is more difficult and expensive to produce and is contemplated for use with permanent containers or mugs. On the other hand, the embodiment that is a removable is generally contemplated for use with disposable and inexpensive containers such as those sold by many coffee establishments and restaurants that allow for drinking hot coffee, tea or hot chocolate while on traveling.

The foregoing represents preferred embodiments of the present invention and is not intended to limit the scope of the invention.